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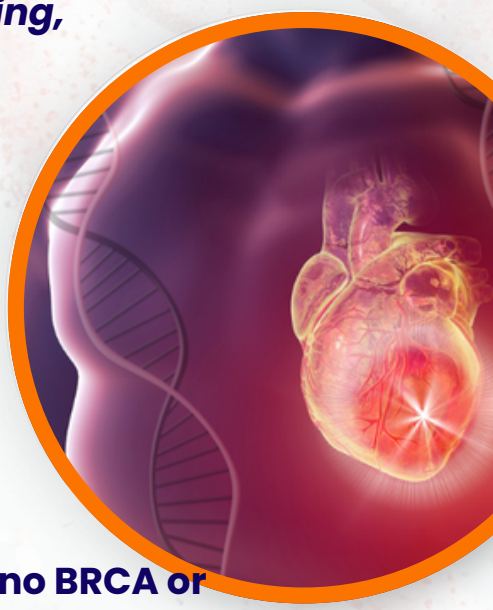
OMNIINSIGHT™ BREAST CANCER PROGRAM

*A comprehensive, MENA-focused approach integrating **polygenic risk scores (PRS), monogenic variant testing, clinical factors, and lifestyle** to deliver individualized breast cancer prevention strategies.*



WHY PRS MATTERS

- Traditional genetic testing alone **is not enough.**
- PRS detects hidden high risk—**even in women with no BRCA or other mutations.**
- **PRS also modifies risk for mutation carriers:** two women with the same mutation can have very different levels of risk.
- Uses a clinically validated multi-ancestry PRS, calibrated for diverse populations including the **MENA region.**

PERSONALIZED PREVENTION

Results are translated into **a clinically action able care plan** aligned with best- practice guidelines, enabling personalized recommendations **for screening, lifestyle modification, medical interventions, and genetic counseling.**

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MONOGENIC RISK COVERAGE

Monogenic Risk Coverage Identifies high-impact pathogenic variants across NCCN- recommended breast cancer genes, including: **BRCA1, BRCA2, ATM, BARD1, CDH1, CHEK2, NF1, PALB2, PTEN, RAD51C, RAD51D, STK11, TP53.**

POWERED BY BLENDED GENOME EXOME

The innovative genomic technology is developed in collaboration **with Broad Clinical Labs at Harvard and MIT,** the program combines **95.5× Whole- Exome Sequencing (WES)** with **genome-wide lcWGS** to detect both rare mutations and polygenic risk with high precision.

Testing is performed through **CAP/CLIA-accredited laboratories,** with analytics support from **Allelica**, (MGB/LMM), and regional collaboration with **Novo Genomics.**

Equipped with most precise risk assessment available.

SCAN ME

Get started today
info@avigena.com
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GENOMIC APPROACH TO PREVENTION

Introducing BC-PRS

What is BC-PRS ?

A computational score derived from thousands to millions of genetic variants (SNPs).

Estimates an individual's inherited riskfor common diseases such as Breast Cancer.

Requires a single DNA test (blood or saliva); stable across life

Independent of traditional risk factors Complements—does not replace —current clinical models

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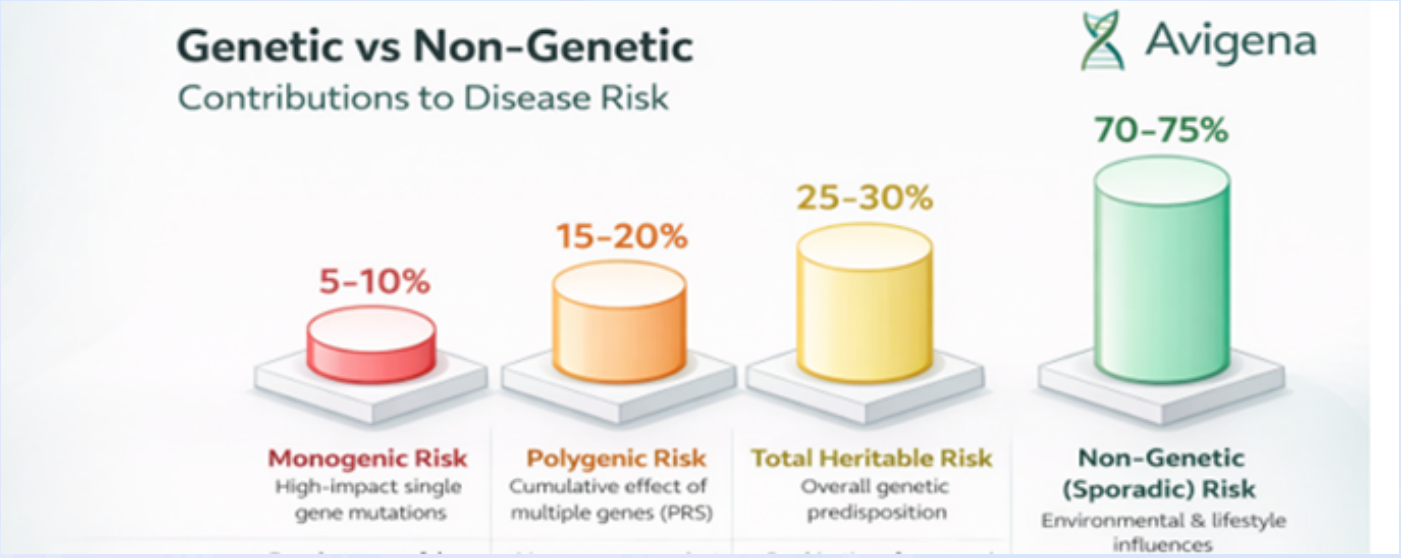
BC-PRS: A NEW PARADIGM

- 30% of BC risk is genetic
- Standards tests (e.g. WES/WGS) detect only monogenic variants
- Polygenic risk contributes far more than rare mutations (4-fold greater impact)
- Strong predictor of lifetime and recurrent BC risk

DISTRIBUTION OF FACTORS CONTRIBUTING TO BC RISK



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WHO SHOULD TAKE THIS TEST?

Female – Adult (18-75 years)

- Healthy women interested in understanding their personal risk of breast cancer.
- Women diagnosed with breast cancer seeking to understand the genetic factors contributing to their disease.
- Women who carry a rare monogenic mutation (e.g., BRCA) associated with increased breast cancer risk.
- Women with a family history of breast cancer.

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ARAB-OPTIMIZED BC-PRS

- Most PRS models are European-based; Avigena patent the first Arab-validated BC-PRS
- Validated in Arab cohorts in addition to various ancestries

AVIGENA AWARDED PATENTS FOR FIRST ARAB-FOCUSED BREAST CANCER AND CORONARY ARTERY DISEASE

Avigena Patent granted (No.13249, Leb. IPPS, 2024)

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FROM GENETIC RISK TO PREVENTIVE ACTION

40% improvement in early Detection with PRS vs. Mammography

Standard Screening Only (Age-Based Mammography)	PRS + Mammography (Risk-Based Screening)
Women enter screening at age 40–50	PRS identifies risk from early life
Uniform intervals (e.g., every 2 years)	Tailored screening: early for high-risk, later for low-risk
Misses high-risk younger women	Early detection in high-risk individuals
Potential over-screening of low-risk women	Reduced over-screening in low-risk women

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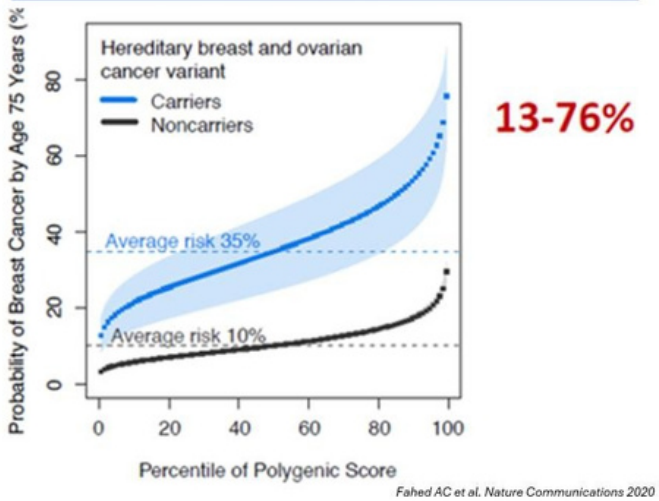
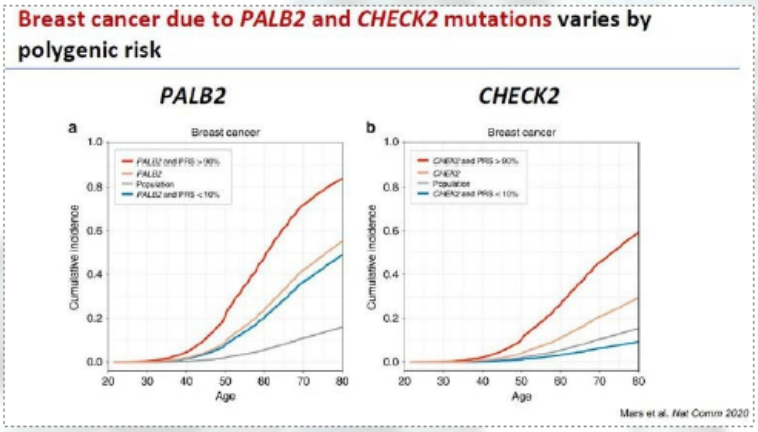
FROM GENETIC RISK TO PREVENTIVE ACTION
EVEN WITH THE SAME MONOGENIC MUTATION, RISK CAN VARY WIDELY—PRS HELPS EXPLAIN AND STRATIFY THAT RISK

Substantial gradient of risk ranges by both monogenic and polygenic state in Breast cancer



Fahed AC et al. Nature Communications 2020

Breast cancer due to *PALB2* and *CHECK2* mutations varies by polygenic risk



YEAR IN REVIEW

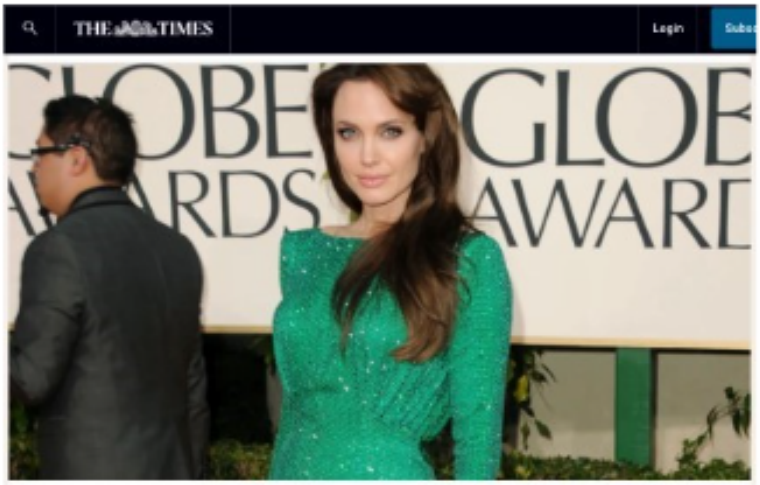
Genomic Medicine Year in Review: 2020

Teri A. Manolio,[1,*] Carol J. Bult,[2] Rex L. Chisholm,[3] Patricia A. Deverka,[4] Geoffrey S. Ginsburg,[5] Madison Goldrich,[3] Gail P. Jarvik,[6] George A. Mensah,[7] Mary V. Relling,[8] Dan M. Roden,[9] Robb Rowley,[1] Cecilia Tamburro,[1] Marc S. Williams,[10] and Eric D. Green[1]

Is Anything Truly Monogenic?

Fahed, A.C., et al. (2020). Polygenic Background Modifies Penetrance of Monogenic Variants for Tier 1 Genomic Conditions. Nat. Commun. 11, 3635

Genomic variation influencing disease risk is commonly divided into monogenic variants of large effect and polygenic variants of small effect, but the interplay between monogenic and polygenic risk has not been widely examined. Data from over 80,000 individuals from the UK Biobank and Color Genomics laboratory carrying monogenic risk variants for HBOC, Lynch syndrome, and FH were analyzed to show that polygenic background significantly influences the risk of developing disease by age 75. Odds ratios for coronary disease, for example, in monogenic carriers of FH variants



Angelina Jolie had a preventive mastectomy after doctors told her she had an 87 per cent risk of breast cancer

'Jolie gene' BRCA1 is not a cancer certainty

Kat Lay, Health Correspondent

Friday September 11 2020, 12.01am, The Times

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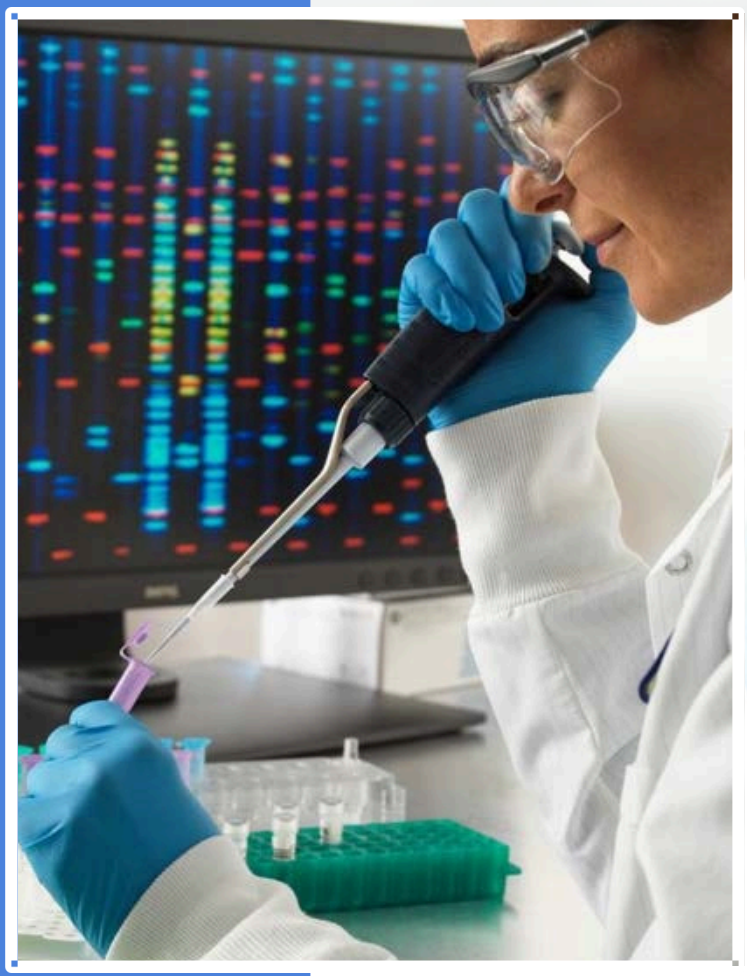

WHY PRS MATTERS FOR BREAST CANCER

- PRS provides women with a personalized breast cancer risk estimate.
- It enables more informed decisions on screening and prevention.
- PRS stratifies risk beyond monogenic mutations like BRCA.
- Age-based screening alone can miss early cases—PRS helps detect risk earlier.
- Early detection and targeted prevention can reduce breast cancer deaths.
- High-risk women can receive tailored guidance to lower their risk.

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Early Detection guided by the PRS prevents Breast Cancer and saves lives

Predicting Medical Events

Anticipating health issues before they occur

Preventing Breast Cancer

Reducing risk through early intervention.

Identifying High-Risk Individuals

Early detection of at-risk patients

Polygenic Risk Score (PRS)

Precision medicine approach to prevention

Disclaimer: Educational material only; PRS must be interpreted by qualified healthcare professionals within clinical context

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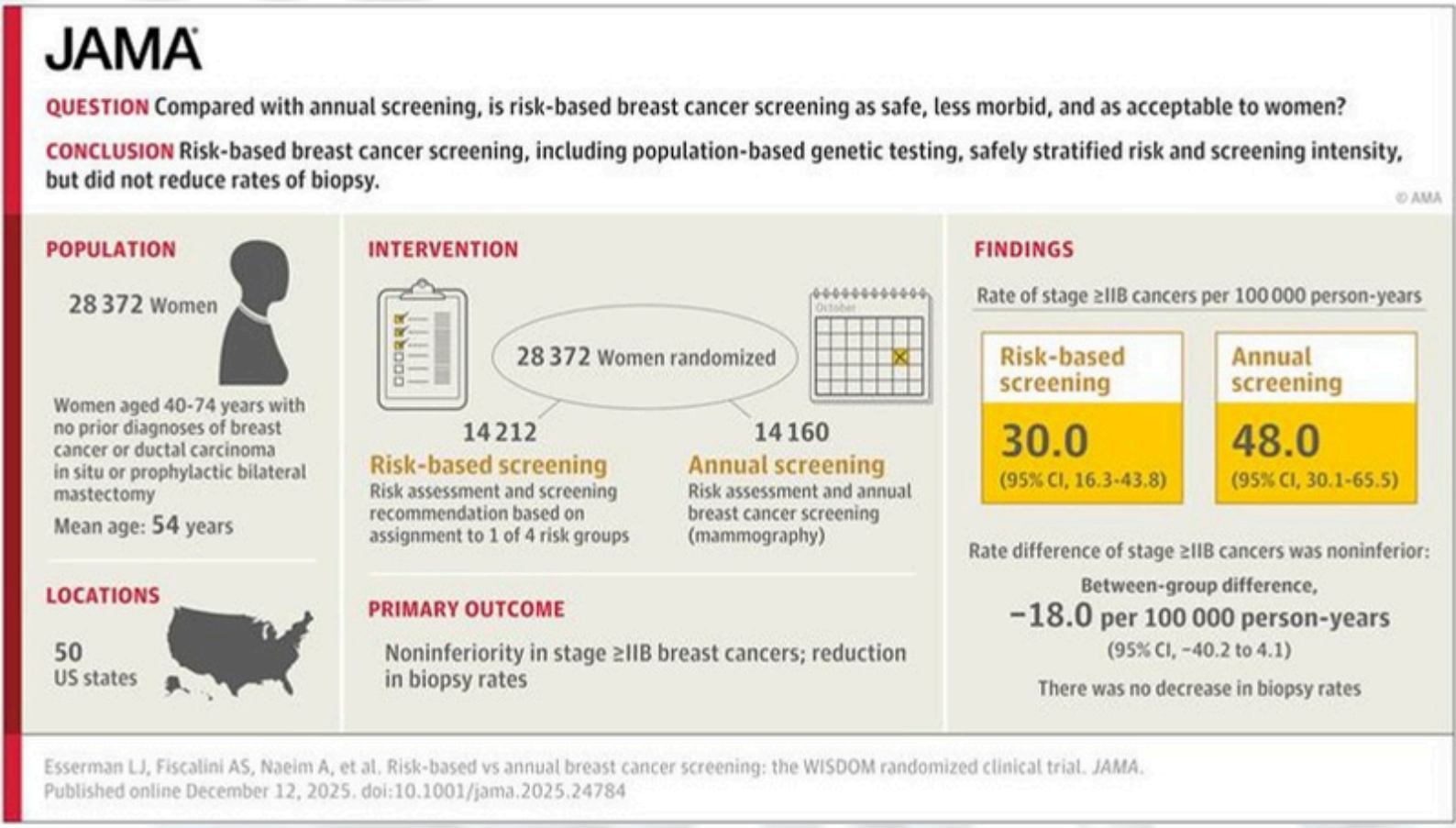
Risk-based screening was associated with a ~38% reduction in advanced-stage (≥IIB) breast cancers

compared to annual screening, reflecting a significant improvement in early detection



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JAMA | Original Investigation | WOMEN'S HEALTH

Risk-Based vs Annual Breast Cancer Screening
The WISDOM Randomized Clinical Trial

Laura J. Esserman, MD, MBA; Allison S. Fiscalini, MPH; Arash Naeim, MD, PhD; Laura J. van't Veer, PhD; Andrea Kaster, MD; Maren T. Scheuner, MD; Andrea Z. LaCroix, PhD; Alexander D. Borowsky, MD; Hoda Anton-Culver, PhD; Olufunmilayo I. Olopade, MD; James Esserman, MD; Rachael Lancaster, MD; Lisa Madlensky, PhD; Amie M. Blanco, MS; Katherine S. Ross, MS; Deborah L. Goodman, MD, PhD; Barry S. Tong, MS; Michael Hogarth, MD; Diane Heditsian, BA; Susie Brain, BSc; Vivian Lee, BA; Kelly Blum, MS; Mi-Ok Kim, PhD; Leah P. Sabacan, MBA; Kirkpatrick B. Fergus, MD; Christina Yau, PhD; Hannah L. Park, PhD; Barbara A. Parker, MD; Celia Kaplan, DrPH; Kim F. Rhoads, MD; Suzanne Eder, CFNP; Kelly Adduci, MPH; Jeffrey B. Matthews, PhD; Neil S. Wenger, MD; Yiwey Shieh, MD; Robert A. Hiatt, MD, PhD; Elad Ziv, MD; Jeffrey A. Tice, MD; Martin Eklund, PhD

IMPORTANCE Individual breast cancer risk can guide screening initiation, frequency, use of supplemental imaging, and preventive measures to improve breast cancer screening by shifting resources from low-risk women to high-risk women.

OBJECTIVE To determine whether risk-based breast cancer screening is a feasible alternative to annual mammography.

DESIGN, SETTING, AND PARTICIPANTS Parallel-group, pragmatic, multicenter randomized clinical trial comparing risk-based (n = 14 212) with annual (n = 14 160) breast cancer screening. Women aged 40 to 74 years without prior diagnoses of breast cancer or ductal carcinoma in situ, or prophylactic bilateral mastectomy, were recruited from all 50 US states from September 2016 to February 2023, with follow-up through September 5, 2025 (median follow-up, 5.1 years). Statistical analysis was conducted between July and November 2025. All study procedures were conducted via an online platform. Women who declined randomization were enrolled in an observational cohort.

INTERVENTIONS Risk assessment included sequencing of 9 susceptibility genes, polygenic risk score, and the Breast Cancer Surveillance Consortium version 2 model. The risk-based group received 1 of 4 recommendations: (1) highest risk (≥6% 5-year risk, high-penetrance pathogenic variant): alternating mammography and magnetic resonance imaging (MRI) every 6 months and counseling; (2) elevated risk (top 2.5 risk percentile by age): annual mammography and risk-reduction counseling; (3) average risk: biennial mammography; and (4) low risk (aged 40-49 years and <1.3% 5-year risk): no screening until risk is 1.3% or greater or age 50 years.

MAIN OUTCOMES AND MEASURES The coprimary outcomes included noninferiority for stage ≥IIB cancers and superiority in reducing biopsy rates. Secondary outcomes included identification of stage ≥IIA cancers, mammogram rates, uptake of prevention strategies in higher risk cohorts, preference for screening group in the observational cohort, ductal carcinoma in situ, MRI, and stage-specific cancer rates.

RESULTS A total of 28 372 women were randomized. The mean (SD) age was 54 (9.6) years and the majority were non-Hispanic White (77%). The rate of stage ≥IIB cancers was noninferior in the risk-based compared with the annual group (risk-based: 30.0 [95% CI, 16.3-43.8] vs annual: 48.0 [95% CI, 30.1-65.5] per 100 000 person-years; rate difference, −18.0 per 100 000 person-years [95% CI, −40.2 to 4.1]). The rate of breast biopsies was not lower in the risk-based group (rate difference, 98.7 per 100 000 person-years [95% CI, −17.9 to 215.3]) despite fewer mammograms (rate difference, −3835.9 [95% CI, −4516.8 to −3154.9]). The cumulative incidence of cancer, biopsy, mammogram, and MRI increased as risk category increased. In the observational cohort, 89% of participants (15 980/18 031) chose risk based.

CONCLUSIONS Risk-based breast cancer screening that includes population-based genetic testing safely stratified risk and screening intensity, but did not reduce biopsy rates.

TRIAL REGISTRATION ClinicalTrials.gov Identifier: NCT02620852

JAMA. doi:10.1001/jama.2025.24784
Published online December 12, 2025.

Visual Abstract
Research Summary
Editorial
Supplemental content
Related article at jamainternalmedicine.com

Author Affiliations: Author affiliations are listed at the end of this article.

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OmniInsight™ - Breast Cancer
Genomics-guided breast cancer risk prediction and prevention

OmniInsight™ Breast Cancer (OI-BC™) Product Code: OI-BC-02	**Test Name**	**Description**
	Comprehensive Breast Cancer Genomic Risk Stratification (PRS + Monogenic Analysis)	Designed for prevention-first risk assessment prior to disease onset rather than post-diagnostic genetic evaluation
	Polygenic Risk Score (PRS) Genome-wide polygenic susceptibility assessment Breast Cancer PRS: 533K–693K variants using ancestry-specific models	**Included Genes** BRCA1, BRCA2, ATM, BARD1, CDH1, CHEK2, NF1, PALB2, PTEN, RAD51C, RAD51D, STK11, TP53

Clinical Intent: Not intended for the diagnosis of breast cancer. Designed for genetic risk prediction and preventive management. Supports risk-based screening using polygenic risk scores (PRS).

Technology: Blended Genome-Exome™ sequencing (95.5× WES + genome-wide lcWGS), performed in a CAP/CLIA-certified laboratory in collaboration with the Broad Institute (MIT/Harvard).

***Clinical Output*:** Integrates PRS, monogenic variants, clinical and lifestyle factors to generate an integrated genomic report, personalized prevention roadmap, and virtual genetic counseling via the Avigena OmniInsight™ platform.

Clinical Indications

Population	Description
Asymptomatic adult women (18–75 years)	For personalized breast cancer risk assessment. Use PRS as a risk-based screening tool.
Women with breast cancer	To evaluate inherited susceptibility
Women carrying a monogenic mutation (e.g., BRCA)	PRS modifies the penetrance of monogenic variants (e.g., BRCA), resulting in different absolute risks among carriers of the same variant.
Women with a family history of breast cancer	To refine individual risk beyond family-history–based assessment.

Logistics

- Sample Collection: Non-invasive saliva collection kit
- Turnaround Time: 6–8 weeks
- Laboratory: CAP/CLIA-certified laboratory in collaboration with the Broad Institute (MIT/Harvard)
- CPT Codes: 81599, 96040

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Leading U.S. Centers Advancing Clinical Use of Polygenic Risk Scores (PRS)

Academic medical center	Location (USA)	PRS delivery model	Main PRS focus / use
Mass General Brigham/Harvard	Boston,MA	Clinical test via LMM+ translational programs	Cardiovascular PRS(clinical); other common diseases (research/implementation)
Massachusetts General Hospital/ Harvard	Boston,MA	Preventive genomics clinics	Cardiovascular and common disease PRS
Brigham and Women's Hospital	Boston,MA	Preventive genomics & clinical genetics programs	Cardiometabolic and common disease PRS
Harvard /Mayo Clinic	Rochester, MN	Genome-Informed Risk Assessment)	Cardiovascular, cancer, diabetes
Northwestern Medicine	Chicago, IL	Research-to-care implementation (eMERGE site)	Cardiometabolic and common diseases
Vanderbilt University Medical Center	Nashvill TN	Translational implementation (precision medicine programs)	Cardiovascular, metabolic and cancer PRS
University of Chicago Medicine	Chicago, IL	Clinical genomics programs	Cancer PRS (especially breast cancer)
Baylor College of Medicine	Houston, TX	Clinical genomics framework with PRS partners	Multi-ancestry PRS for common diseases
Penn Medicine	Philadelphia, PA	Biobank-driven research-to-care programs	Cancer and cardiometabolic PRS
Cleveland Clinic	Cleveland, OH	Genomic medicine programs	Cardiovascular and common diseases PRS

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Shipment Logistics Instructions

A. Shipment Address (via DHL or other courier services)

Broad Clinical Labs Receiving Lab 132 27 Blue Sky Drive Burlington,
MA 01803, USA Attention: Nick Argiro Phone: +1 617-714-8952

B. Sample Labeling Requirements

Product: DNA Genotek saliva collection kits (ORAgene)

All samples must include **two unique identifiers** clearly visible on the collection tube:

1. Barcode (Primary Identifier):
The barcode is pre-printed onthetube andmustremain clearly visible.
Do not cover or obscure the barcode.

2. Patient Identifier (Secondary Identifier):

A label including **the patient's full name and date of birth must be affixed to the tube.**

Ensure that the label does not cover or obscure the barcode or kit code.

Samples may be rejected if:

- The barcode is covered or unreadable
- Patient identifiers are missing or incomplete

C. Required Documentation (to be shared electronically)

Please submit the following documents via email, WhatsApp, or the Clinic Portal:

- Barcode (as printed on the saliva collection
- tube) Patient full name and date of birth
- Signed Consent Forms Completed Patient
- Intake Forms DHL shipment details and tracking information

Handling Instructions:

Store samples at room temperature. Avoid exposure to extreme heat.
Forassistance, pleasecontact:

• Email: info@avigena.com • WhatsApp (Avigena Boston): +1 (617) 412-5580